IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION

WSOU INVESTMENTS, LLC d/b/a BRAZOS LICENSING AND DEVELOPMENT, Plaintiff, v. HUAWEI TECHNOLOGIES CO., LTD., HUAWEI TECHNOLOGIES USA INC., HUAWEI DEVICE CO. LTD. (F/K/A HUAWEI DEVICE (DONGGUAN) CO.), HUAWEI DEVICE (SHENZHEN) CO., LTD. (F/K/A HUAWEI DEVICE CO., LTD.), HUAWEI DEVICE USA, INC. Defendants.	§ § § § § § § § § § § § § § §	CIVIL ACTION NO. 6:20-cv-539 **JURY TRIAL DEMANDED**

ORIGINAL COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff WSOU Investments, LLC d/b/a Brazos Licensing and Development ("Brazos" or "Plaintiff"), by and through its attorneys, files this Complaint for Patent Infringement against Defendants Huawei Technologies Co., Ltd., Huawei Technologies USA Inc., Huawei Device Co. Ltd. (f/k/a Huawei Device (Dongguan) Co.), Huawei Device (Shenzhen) Co., Ltd. (f/k/a Huawei Device Co., Ltd.), and Huawei Device USA, Inc. (collectively "Huawei" or "Defendants") and alleges:

NATURE OF THE ACTION

1. This is a civil action for patent infringement arising under the Patent Laws of the United States, 35 U.S.C. §§ 1, et seq., including §§ 271, 281, 284, and 285.

THE PARTIES

2. Brazos is a limited liability corporation organized and existing under the laws of Delaware, with its principal place of business at 605 Austin Ave, Ste 6, Waco, TX 76701.

3. On information and belief, Defendant Huawei Technologies Co., Ltd. is a Chinese corporation that does business in Texas, directly or through intermediaries, with a principal place of business at Bantian, Longgang District, Shenzhen 518129, People's Republic of China.

4. Upon information and belief, Defendant Huawei Technologies USA Inc. is a corporation organized and existing under the laws of Texas that maintains an established place of business at 2391 NE Interstate 410 Loop, San Antonio, TX 78217. Huawei Technologies USA, Inc. is authorized to do business in Texas and may be served via its registered agent, CT Corporation System, 1999 Bryan Street, Suite 900, Dallas, Texas 75201-3136.

5. Upon information and belief, Defendant Huawei Device Co. Ltd. (formerly known as Huawei Device (Dongguan) Co.) is a Chinese corporation that does business in Texas, directly or through intermediaries, and maintains a principal place of business in No.2 of Xincheng Road, Songshan Lake Zone, Dongguan, Guangdong 523808, People's Republic of China.

6. Upon information and belief, Huawei Device (Shenzhen) Co., Ltd. (formerly known as Huawei Device Co., Ltd.) is a wholly-owned subsidiary of Defendant Huawei Device Co. Ltd. is a Chinese corporation that does business in Texas, directly or through intermediaries, and maintains a principal place of business in Bantian, Longgang District, Shenzhen 518129, People's Republic of China.

7. On information and belief, Defendant Huawei Device USA, Inc., is a Texas corporation with a principal place of business located at 5700 Tennyson Parkway, Suite 600, Plano, Texas 75024. Huawei Device USA, Inc. is authorized to do business in Texas and may be served via its registered agent, CT Corporation System, 1999 Bryan Street, Suite 900, Dallas, Texas 75201-3136.

8. All of the Defendants operate under and identify with the trade name "Huawei." Each of the Defendants may be referred to individually as a "Huawei Defendant" and, collectively, Defendants may be referred to below as "Huawei" or as the "Huawei Defendants."

JURISDICTION AND VENUE

9. This is an action for patent infringement which arises under the Patent Laws of the United States, in particular, 35 U.S.C. §§271, 281, 284, and 285.

10. This Court has jurisdiction over the subject matter of this action under 28 U.S.C. §§ 1331 and 1338(a).

11. This Court has specific and general personal jurisdiction over each Huawei Defendant pursuant to due process and/or the Texas Long Arm Statute, because each Huawei Defendant has committed acts giving rise to this action within Texas and within this judicial district. The Court's exercise of jurisdiction over each Huawei Defendant would not offend traditional notions of fair play and substantial justice because Huawei has established minimum contacts with the forum. For example, on information and belief, Huawei Defendants have committed acts of infringement in this judicial district, by among other things, selling and offering for sale products that infringe the asserted patent, directly or through intermediaries, as alleged herein.

12. Venue in the Western District of Texas is proper pursuant to 28 U.S.C. §§1391(b), (c)(3), and 1400(b) because Huawei Technologies USA Inc. and Huawei Device USA Inc. have committed acts of infringement in this judicial district and have a regular and established places of business in this judicial district and in Texas. As non-limiting examples, on information and belief, Huawei Technologies USA Inc. and Huawei Device USA Inc. have sold or offered to sell the Accused Products in this judicial district and have employees or agents that operate Huawei equipment in this judicial district, including at 189 CR 265, Georgetown, TX 78626, 1150 S Bell Blvd, Cedar Park, TX 78613, 1399 S A W Grimes Blvd, Round Rock, TX 78664, 12335 IH 35, Jarrell, TX 76537, 1050 Rabbit Hill Rd, Unit #E, Georgetown, TX 78626, 1602 A W Grimes Blvd, Round Rock, TX 78664, 4120 IH 35 N, Georgetown, TX 78626, 900 CR 272, Leander, TX 78641, 1950 Crystal Falls Pkwy, Leander, TX 78641, 1101 N Industrial Blvd, Round Rock, TX 78681, 506 McNeil Rd, Round Rock, TX 78681, 3210 Chisholm Trail Rd, Round Rock, TX 78681, 112 Roundville Ln, Round Rock, TX 78664, 202 Central Dr W, Georgetown, TX 78628, 3595 E Hwy 29, Georgetown, TX 78626, 1402 W Welch St, Taylor, TX 76574, 3801 Oak Ridge Dr, Round Rock, TX 78681, 1957 Red Bud Ln #B, Round Rock, TX 78664, 6603 S Lakewood Dr, Georgetown, TX 78633, 500 W Front, Hutto, TX 78634.

COUNT ONE - INFRINGEMENT OF U.S. PATENT NO. 8,200,224

13. Brazos re-alleges and incorporates by reference the preceding paragraphs of this Complaint.

14. On June 12, 2012, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 8,200,224 ("the '224 Patent"), entitled "Handover Method and Apparatus Thereof." A true and correct copy of the '224 Patent is attached as Exhibit A to this Complaint.

15. Brazos is the owner of all rights, title, and interest in and to the '224 Patent, including the right to assert all causes of action arising under the '224 Patent and the right to any remedies for the infringement of the '224 Patent.

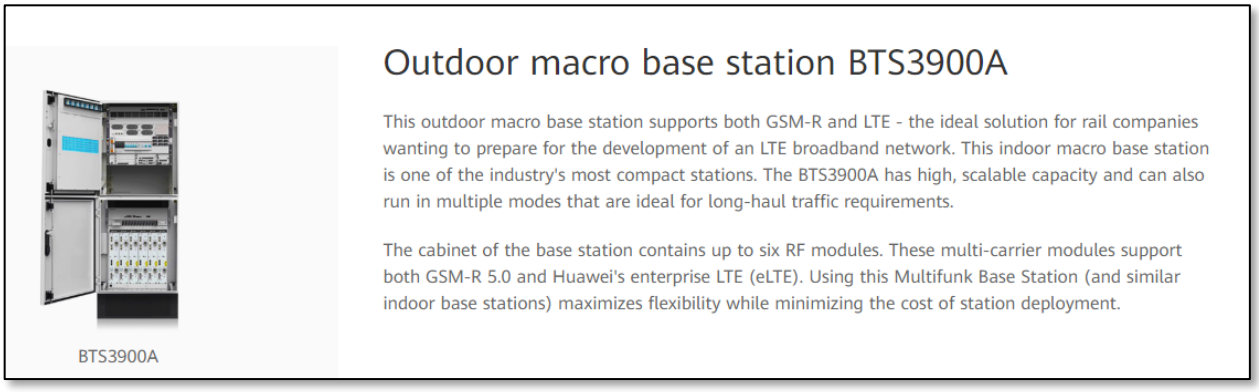
16. Huawei makes, uses, sells, offers for sale, imports, and/or distributes in the United States, including within this judicial district, products such as, but not limited to, Huawei network elements, Huawei LTE routers, Huawei smartphones, Huawei smart home devices, Huawei Trunking Handsets and Terminals, Huawei software for LTE eNodeB (collectively, the "Accused Products").

17. The Accused Products include, but are not limited to, Huawei network elements (e.g., DBS3900 Distributed Base Stations), Huawei LTE routers (e.g., B310 LTE CPE), Huawei smartphones (e.g., Huawei Mate 30), Huawei smart home devices (e.g., E5330), Huawei Trunking Handsets and Terminals (e.g., EP720 Broadband Trunking Handset), Huawei software for LTE eNodeB (e.g., Huawei 3900 Series LTE eNodeB Software).

18. Huawei provides devices and products (e.g., base stations, etc.) which support Long Term Evolution (LTE) connectivity feature. Some of these devices supporting LTE.

https://e.huawei.com/us/products/wireless/elte-trunking/network-element/dbs3900

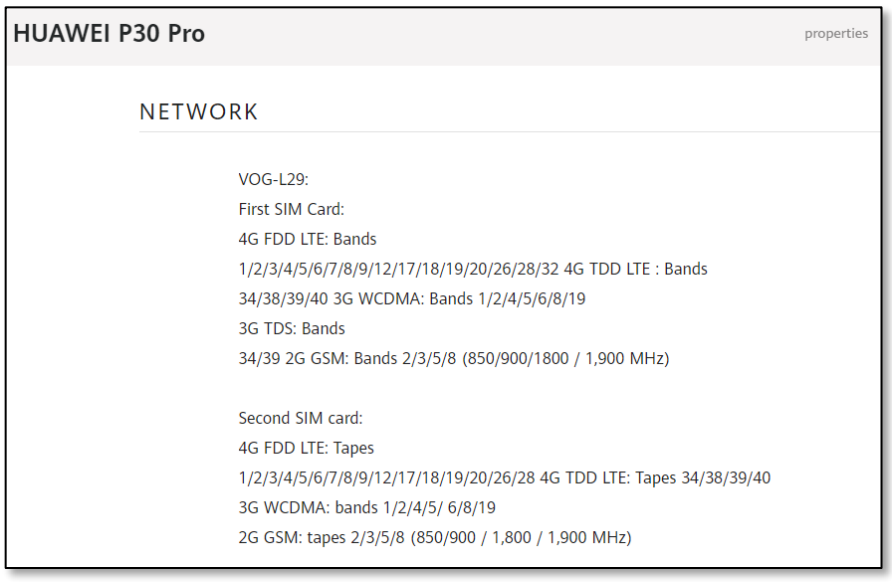
19. Huawei provides an outdoor macro base station supporting LTE.



https://e.huawei.com/us/products/wireless/gsm-r/radio-access-network/bts3900a

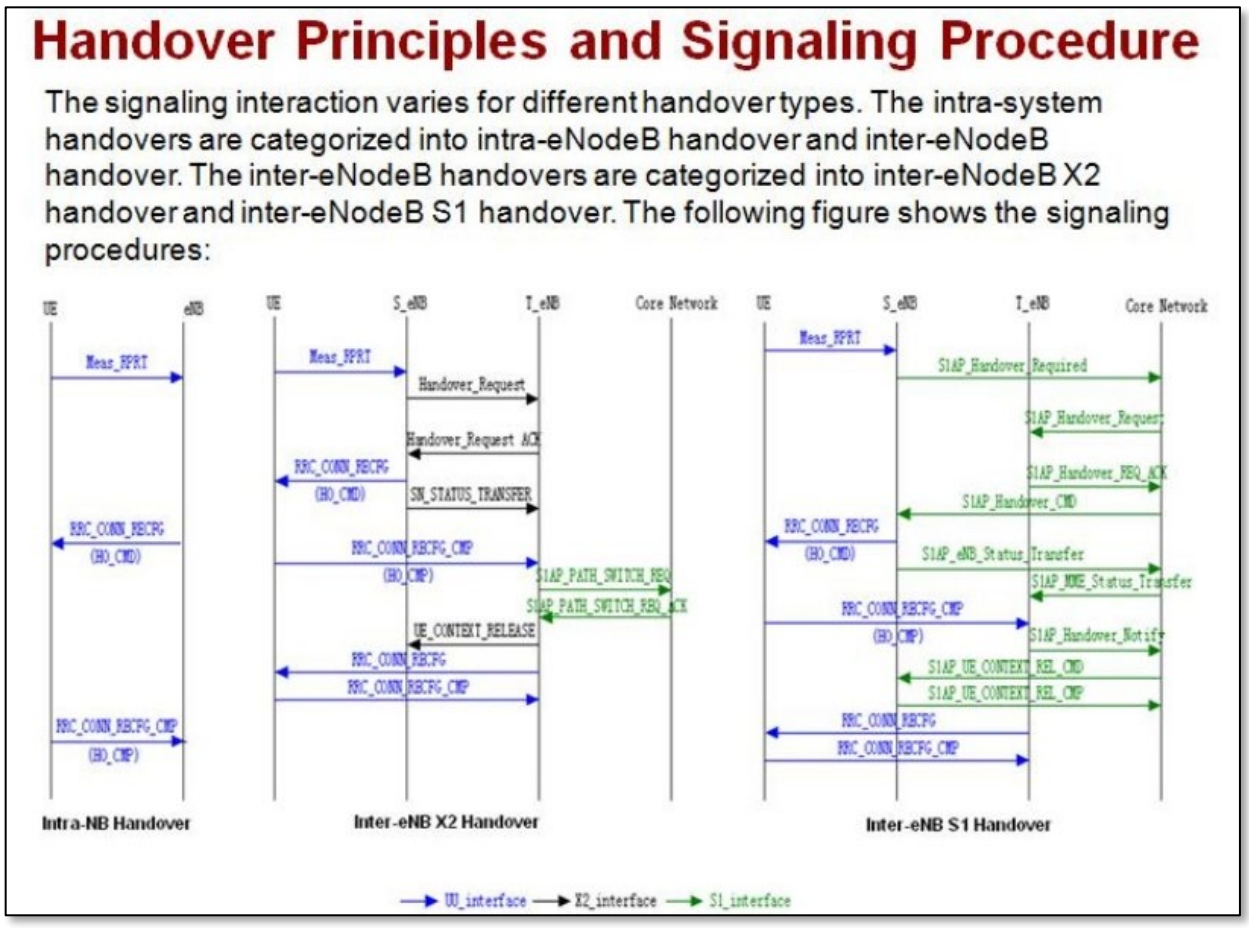
20. Huawei provides LTE routers and mobile devices.

https://consumer.huawei.com/en/support/4g-lte-routers/lte-cpe-b310/



https://consumer.huawei.com/en/phones/p30-pro/specs/

21. Huawei base station and other LTE devices like user equipment (i.e., UEs) support the handover process. Huawei base station can handover the UE to the target base station to provide seamless connectivity.



https://www.scribd.com/document/134164391/LTE-Handover-Troubleshooting-Guide-pdf.

22. Long Term Evolution (LTE) with Evolved Universal Terrestrial Radio Access Network (E-UTRAN) constitutes a telecommunication system for mobile devices and data terminals/nodes (or a plurality of base stations).

Radio Resource Control (RRC) sublayer in E-UTRAN (or, LTE) mobile communication system provides mobility functions such as handover, context transfer at handover, etc. in base stations.

- Security functions including key management;
- Establishment, configuration, maintenance and release of point to point Radio Bearers;
- Mobility functions including:
  - UE measurement reporting and control of the reporting for inter-cell and inter-RAT mobility;
  - Handover;
  - UE cell selection and reselection and control of cell selection and reselection;
  - Context transfer at handover.

https://www.etsi.org/deliver/etsi_ts/136300_136399/136300/15.03.00_60/ts_136300v150300p.pdf.

23. In RRC_Connected state, a User Equipment (or, UE) has an E-UTRAN-RRC connection with a cell (or base station). The E-UTRAN communication system knows the connection between a UE and a cell. The communication network in this state decides which UE shall connect to which cell. As a result, handover takes place to facilitate such connections and seamless connectivity. (

- **RRC_CONNECTED**:
  - UE has an E-UTRAN-RRC connection;
  - UE has context in E-UTRAN;
  - E-UTRAN knows the cell which the UE belongs to;
  - Network can transmit and/or receive data to/from UE;
  - Network controlled mobility (handover and inter-RAT cell change order to GERAN with NACC);
  - Neighbour cell measurements;
  - Sidelink communication transmission and reception;

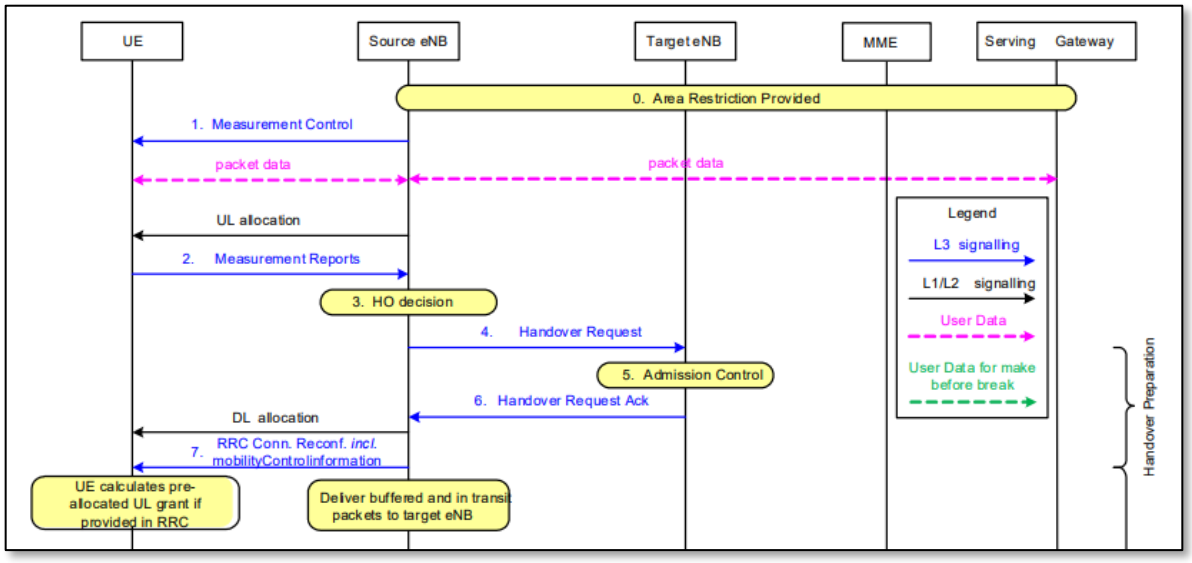
https://www.etsi.org/deliver/etsi_ts/136300_136399/136300/15.03.00_60/ts_136300v150300p.

> 5.3.1.3 Connected mode mobility
>
> In RRC_CONNECTED, the network controls UE mobility, i.e. the network decides when the UE shall connect to which E-UTRA cell(s), or inter-RAT cell. For network controlled mobility in RRC_CONNECTED, the PCell can be changed using an *RRCConnectionReconfiguration* message including the *mobilityControlInfo* (handover), whereas the SCell(s) can be changed using the *RRCConnectionReconfiguration* message either with or without the *mobilityControlInfo*.

pdf

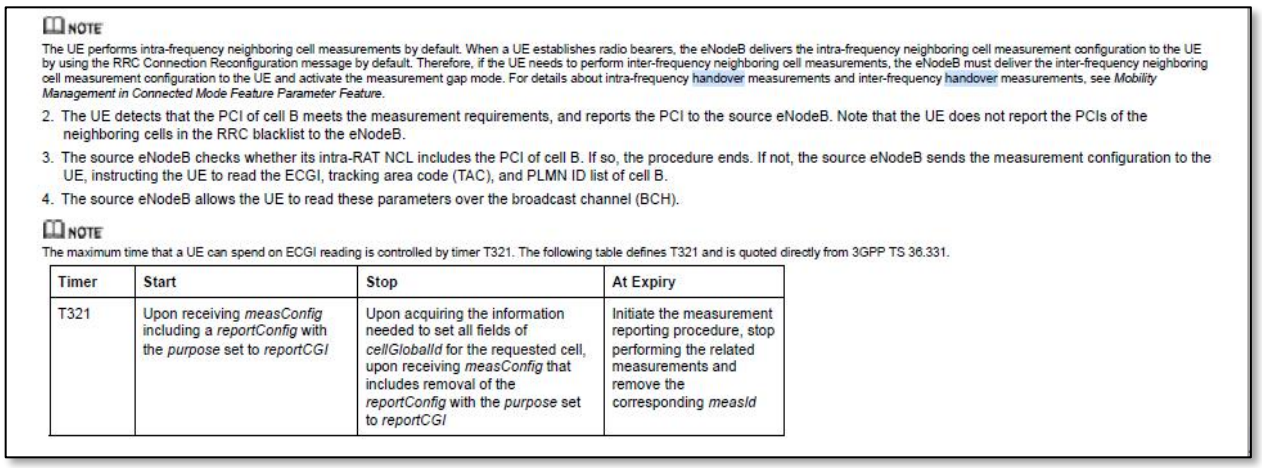
https://www.etsi.org/deliver/etsi_ts/136300_136399/136331/15.03.00_60/ts_136331v150300p.pdf

24. UEs (or mobile stations) monitor target eNodeBs for the handover process which is controlled by LTE base stations ("eNodeBs"). LTE mobility functionality is configured by the network and is carried out by eNodeBs that are in communication with the UEs.



https://www.etsi.org/deliver/etsi_ts/136300_136399/136300/15.03.00_60/ts_136300v150300p.pdf

25. When a UE establishes radio bearers, the eNodeB delivers the neighboring cell measurement configuration to the UE by using the RRC Connection Reconfiguration message. UE performs neighboring cell measurements and sends details to source eNodeB.



NOTE

The UE performs intra-frequency neighboring cell measurements by default. When a UE establishes radio bearers, the eNodeB delivers the intra-frequency neighboring cell measurement configuration to the UE by using the RRC Connection Reconfiguration message by default. Therefore, if the UE needs to perform inter-frequency neighboring cell measurements, the eNodeB must deliver the inter-frequency neighboring cell measurement configuration to the UE and activate the measurement gap mode. For details about intra-frequency handover measurements and inter-frequency handover measurements, see *Mobility Management in Connected Mode Feature Parameter Feature*.

2. The UE detects that the PCI of cell B meets the measurement requirements, and reports the PCI to the source eNodeB. Note that the UE does not report the PCIs of the neighboring cells in the RRC blacklist to the eNodeB.
3. The source eNodeB checks whether its intra-RAT NCL includes the PCI of cell B. If so, the procedure ends. If not, the source eNodeB sends the measurement configuration to the UE, instructing the UE to read the ECGI, tracking area code (TAC), and PLMN ID list of cell B.
4. The source eNodeB allows the UE to read these parameters over the broadcast channel (BCH).

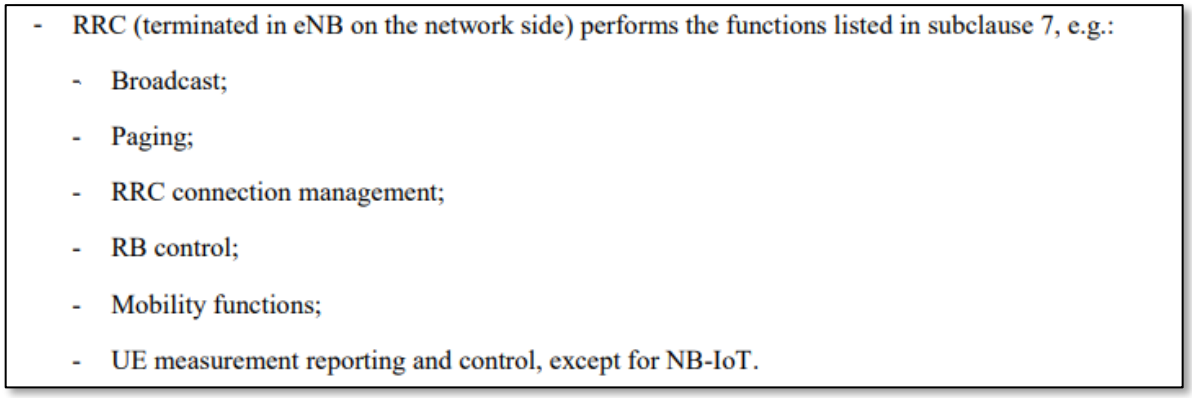
NOTE

The maximum time that a UE can spend on ECGI reading is controlled by timer T321. The following table defines T321 and is quoted directly from 3GPP TS 36.331.

Timer	Start	Stop	At Expiry
T321	Upon receiving *measConfig* including a *reportConfig* with the *purpose* set to *reportCGI*	Upon acquiring the information needed to set all fields of *cellGlobalId* for the requested cell, upon receiving *measConfig* that includes removal of the *reportConfig* with the *purpose* set to *reportCGI*	Initiate the measurement reporting procedure, stop performing the related measurements and remove the corresponding *measId*

https://www.scribd.com/document/182810551/ANR-Feature-Huawei.

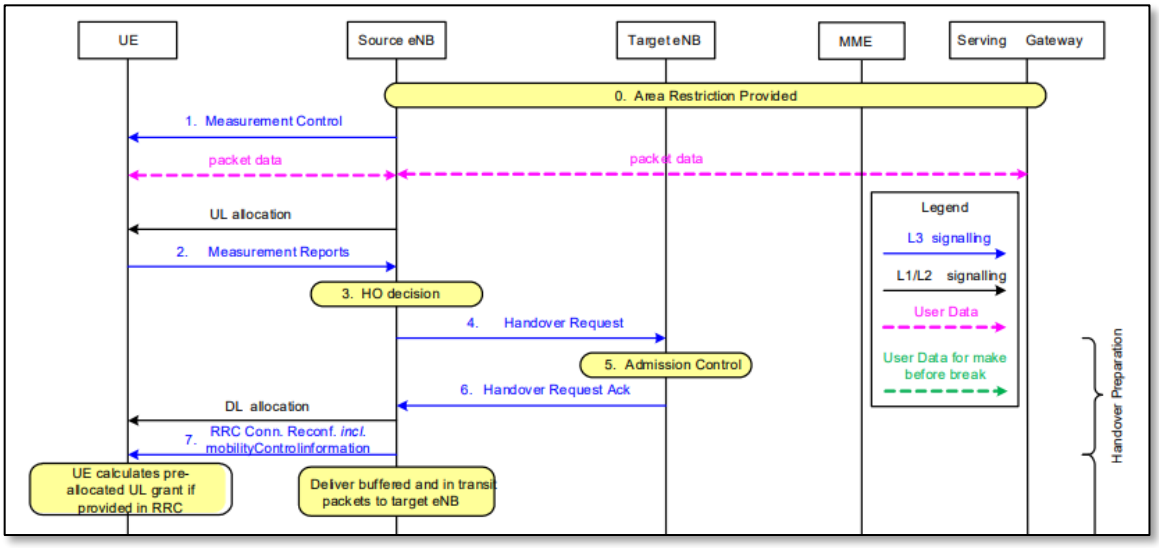
26. RRC sublayer inherently provides UE measurement reporting and control function.



- RRC (terminated in eNB on the network side) performs the functions listed in subclause 7, e.g.:
  - Broadcast;
  - Paging;
  - RRC connection management;
  - RB control;
  - Mobility functions;
  - UE measurement reporting and control, except for NB-IoT.

https://www.etsi.org/deliver/etsi_ts/136300_136399/136300/15.03.00_60/ts_136300v150300p.pdf

27. The source eNodeB (i.e., base station) receives measurement reports from UE via established RRC connection, as shown in step 2.



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Below is a more detailed description of the intra-MME/Serving Gateway HO procedure:

0 The UE context within the source eNB contains information regarding roaming and access restrictions which were provided either at connection establishment or at the last TA update.

1 The source eNB configures the UE measurement procedures according to the roaming and access restriction information and e.g. the available multiple frequency band information. Measurements provided by the source eNB may assist the function controlling the UE's connection mobility.

2 A MEASUREMENT REPORT is triggered and sent to the eNB.

3 The source eNB makes decision based on MEASUREMENT REPORT and RRM information to hand off the UE.

https://www.etsi.org/deliver/etsi_ts/136300_136399/136300/15.03.00_60/ts_136300v150300p.pdf.

28. UE sends measurement quantities such as RSRP, RSRQ, RSSI, etc. within its measurement report to support mobility.

5.1.8 Physical layer measurements definition

The physical layer measurements to support mobility are classified as:

- within E-UTRAN (intra-frequency, inter-frequency);
- between E-UTRAN and GERAN/UTRAN (inter-RAT);
- between E-UTRAN and non-3GPP RAT (Inter 3GPP access system mobility).

For measurements within E-UTRAN two basic UE measurement quantities shall be supported:

- Reference signal received power (RSRP);
- Reference signal received quality (RSRQ).

In addition, the following UE measurement quantity may be supported:

- Received signal strength indicator (RSSI);
- Reference signal signal to noise and interference ratio (RS-SINR).

RSRP measurement is based on the following signals:

- Cell-specific reference signals; or
- CSI reference signals in configured discovery signals; or
- Narrowband secondary synchronization signal for NB-IoT UEs.

https://www.etsi.org/deliver/etsi_ts/136300_136399/136300/15.03.00_60/ts_136300v150300p.pdf.

29. These measurement quantities include signal quality values from neighboring cells and can be provided in measurement reports to initiate handover.

10.1.3 Measurements

Measurements to be performed by a UE for intra/inter-frequency mobility can be controlled by E-UTRAN, using broadcast or dedicated control. In RRC_IDLE state, a UE shall follow the measurement parameters defined for cell reselection specified by the E-UTRAN broadcast. The use of dedicated measurement control for RRC_IDLE state is possible through the provision of UE specific priorities (see sub-clause 10.2.4). In RRC_CONNECTED state, a UE shall follow the measurement configurations specified by RRC directed from the E-UTRAN (e.g. as in UTRAN MEASUREMENT_CONTROL).

https://www.etsi.org/deliver/etsi_ts/136300_136399/136300/15.03.00_60/ts_136300v150300p.pdf

10.1.3.2 Inter-frequency neighbour (cell) measurements

Regarding mobility between different frequency layers (i.e. between cells with a different carrier frequency), UE may need to perform neighbour cell measurements during DL/UL idle periods that are provided by DRX or packet scheduling (i.e. gap assisted measurements).

Network may request UE to measure inter-frequency carriers in RRC_IDLE mode via system information or via dedicated measurement configuration in RRC Connection Release. The UE performs the requested measurements and provides indication of the availability of measurement report to the eNB during RRC Connection Setup or Resume procedure. The network may request UE to report those measurements after security activation.

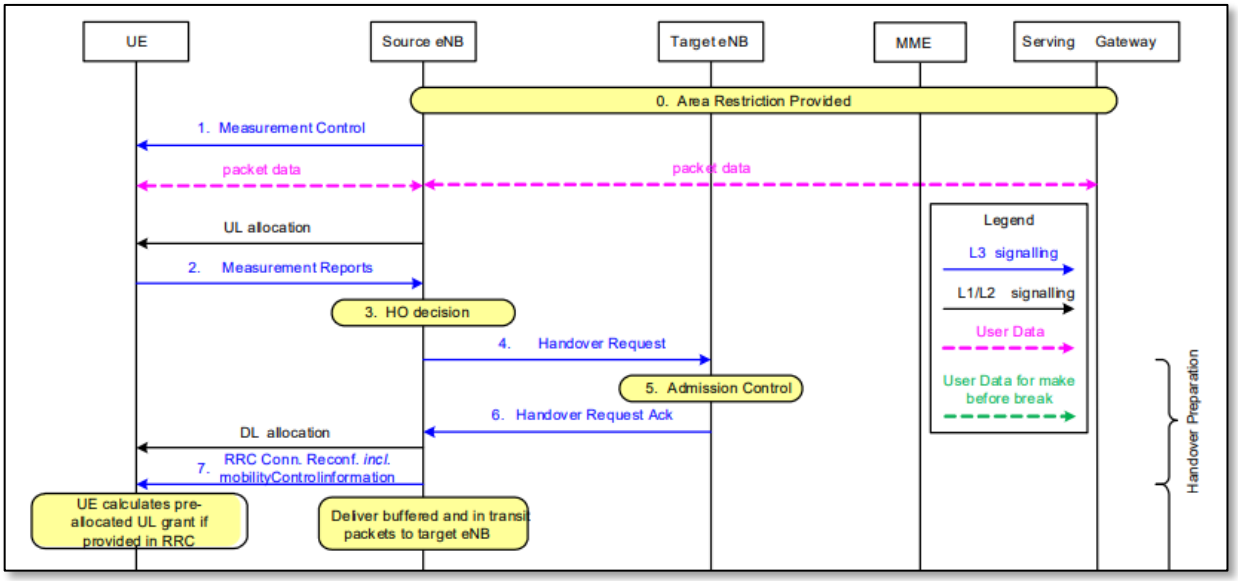
https://www.etsi.org/deliver/etsi_ts/136300_136399/136300/15.03.00_60/ts_136300v150300p.pdf

30. After receiving measurement reports from UE, the source eNodeB selects a target eNodeB from the target candidates' list for Handover Decision (or HO Decision).

2. Handover decision

In the handover decision phase, the eNodeB checks the candidate cell list. Based on the check result, the eNodeB determines whether a handover needs to be initiated and, if so, to which cell the UE is to be handed over.

https://www.honorcup.ru/upload/iblock/164/6.pdf,



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31. Source eNodeB receives the measurement report from the UEBased on the measurement report, source eNodeB selects the target base station for handover.

2 A MEASUREMENT REPORT is triggered and sent to the eNB.

3 The source eNB makes decision based on MEASUREMENT REPORT and RRM information to hand off the UE.

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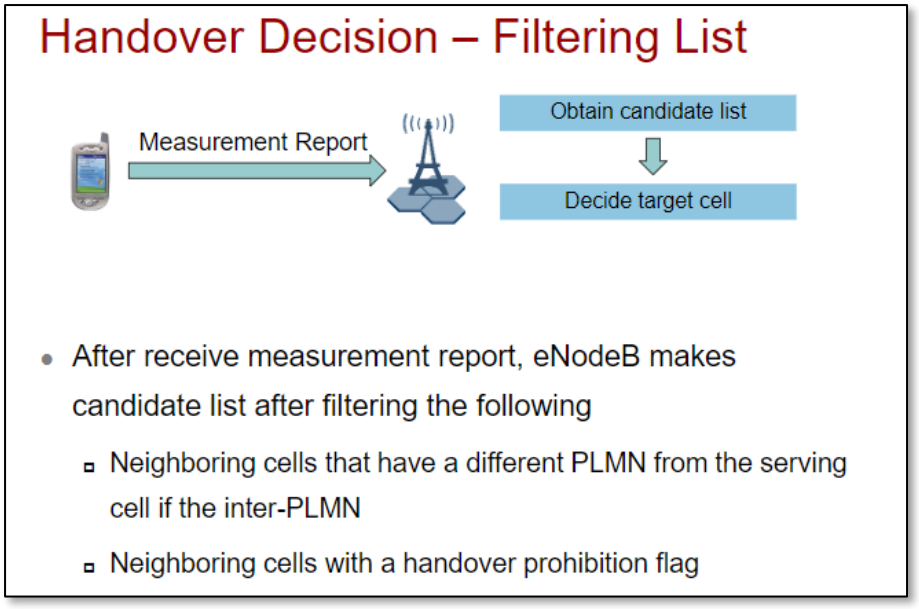
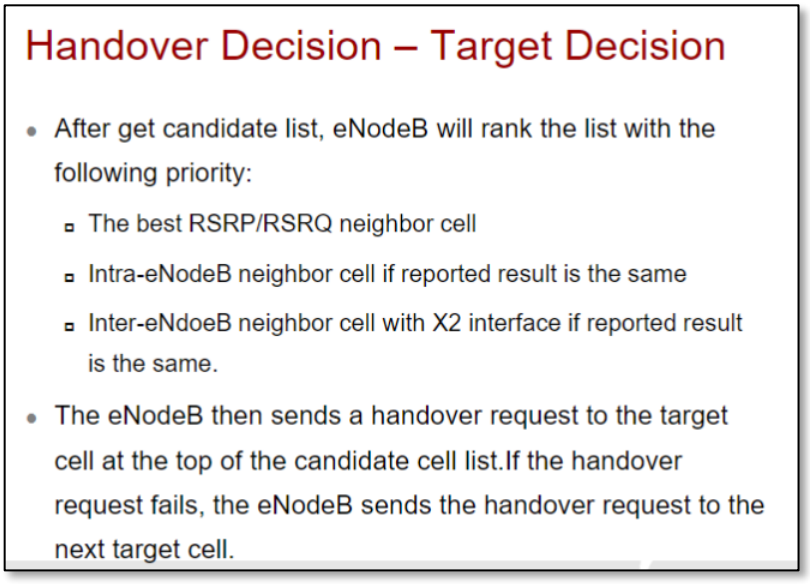
32. Huawei source base station receives the measurement report from UE. The UE measurement report consists of a list of target base stations. The source base station selects the most suitable target base station from the said list to initiate the handover process

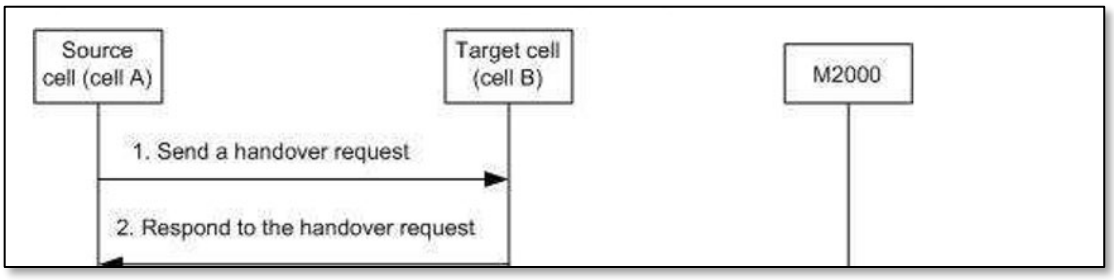


https://www.scribd.com/presentation/228456406/5-LTE-ERAN6-0-Handover-Feature-ISSUE1-00

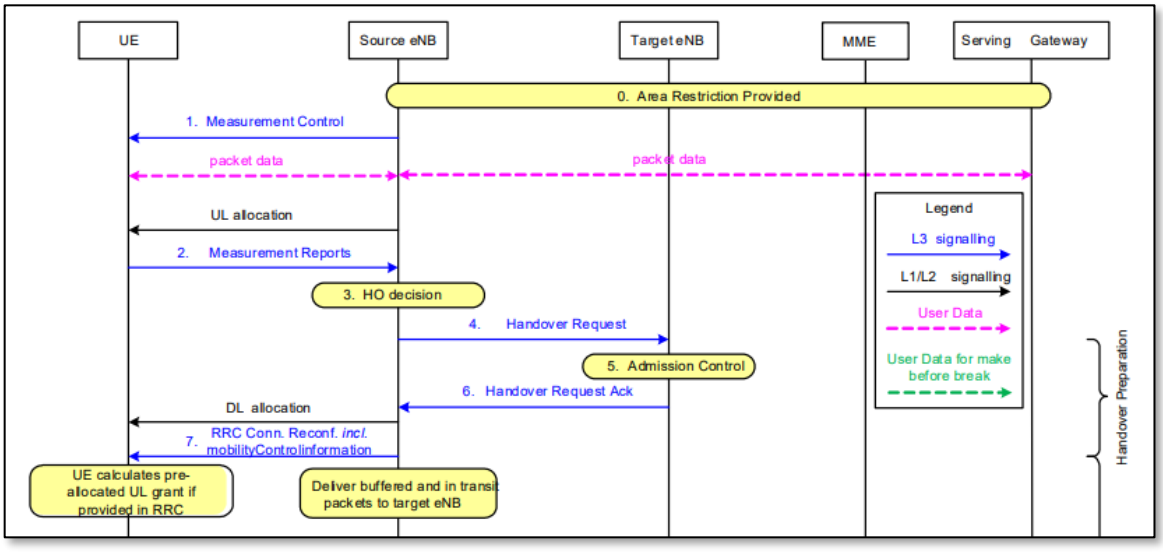


https://www.scribd.com/presentation/228456406/5-LTE-ERAN6-0-Handover-Feature-ISSUE1-00

33. After selecting the target base station from the UE measurement report. The source base station sends the handover request to the target base station.



https://www.scribd.com/document/182810551/ANR-Feature-Huawei



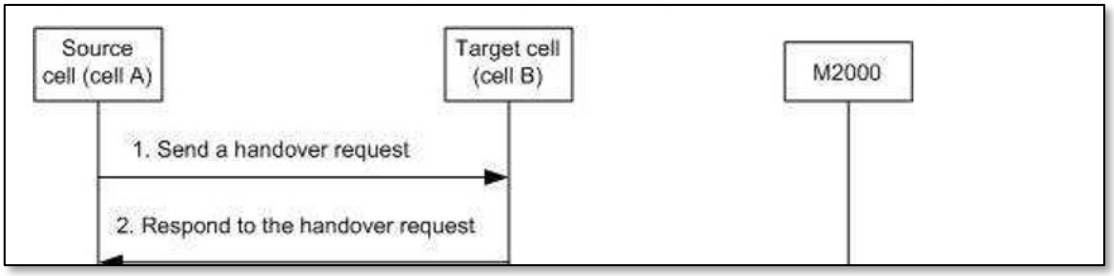
https://www.etsi.org/deliver/etsi_ts/136300_136399/136300/15.03.00_60/ts_136300v150300p.pdf

34. The Handover Request message includes information to prepare target eNodeB for handover.

2	A MEASUREMENT REPORT is triggered and sent to the eNB.
3	The source eNB makes decision based on MEASUREMENT REPORT and RRM information to hand off the UE.
4	The source eNB issues a HANDOVER REQUEST message to the target eNB passing necessary information to prepare the HO at the target side (UE X2 signalling context reference at source eNB, UE S1 EPC signalling context reference, target cell ID, K_{eNB*}, RRC context including the C-RNTI of the UE in the source eNB, AS-configuration, E-RAB context and physical layer ID of the source cell + short MAC-I for possible RLF recovery). UE X2 / UE S1 signalling references enable the target eNB to address the source eNB and the EPC. The E-RAB context includes necessary RNL and TNL addressing information, and QoS profiles of the E-RABs.

https://www.etsi.org/deliver/etsi_ts/136300_136399/136300/15.03.00_60/ts_136300v150300p.pdf

35. Source eNodeB sends a handover request to target eNodeB. Target eNodeB responds to the handover request.



https://www.scribd.com/document/182810551/ANR-Feature-Huawei

36. The target eNodeB responds with a Handover Request Acknowledgement message when the Handover preparation is completed successfully.

> The source eNB sends a HANDOVER REQUEST to the target eNB including the bearers to be setup by the target ENB.
>
> The handover preparation phase is finished upon the reception of the HANDOVER REQUEST ACKNOWLEDGE message in the source eNB, which includes at least radio interface related information (HO Command for the UE), successfully established E-RAB(s) and failed established E-RAB(s).
>
> In case the handover resource allocation is not successful (e.g. no resources are available on the target side) the target eNB responds with the HANDOVER PREPARATION FAILURE message instead of the HANDOVER REQUEST ACKNOWLEDGE message.

https://www.etsi.org/deliver/etsi_ts/136300_136399/136300/15.03.00_60/ts_136300v150300p.pdf

37. In case the requested handover fails due to any reason (e.g., no resources are available on the target side), the target eNodeB responds with a Handover Preparation Failure message. In such a case, the source eNodeB and UE retains some context information to enable the return of UE.

> 10.1.2.1 Handover
>
> The intra E-UTRAN HO of a UE in RRC_CONNECTED state is a UE-assisted network-controlled HO, with HO preparation signalling in E-UTRAN:
>
> - Part of the HO command comes from the target eNB and is transparently forwarded to the UE by the source eNB;
> - To prepare the HO, the source eNB passes all necessary information to the target eNB (e.g. E-RAB attributes and RRC context):
>   - When CA is configured and to enable SCell selection in the target eNB, the source eNB can provide in decreasing order of radio quality a list of the best cells and optionally measurement result of the cells.
>   - When DC is configured, the source MeNB provides the SCG configuration (in addition to the MCG configuration) to the target MeNB.
> - Both the source eNB and UE keep some context (e.g. C-RNTI) to enable the return of the UE in case of HO failure;

https://www.etsi.org/deliver/etsi_ts/136300_136399/136300/15.03.00_60/ts_136300v150300p.pdf.

38. The context kept enables the re-initiation of the Handover process.

One UE behaviour to be performed upon handover is specified, i.e. this is regardless of the handover procedures used within the network (e.g. whether the handover includes X2 or S1 signalling procedures).

The source eNB should, for some time, maintain a context to enable the UE to return in case of handover failure. After having detected handover failure, the UE attempts to resume the RRC connection either in the source PCell or in another cell using the RRC re-establishment procedure. This connection resumption succeeds only if the accessed cell is prepared, i.e. concerns a cell of the source eNB or of another eNB towards which handover preparation has been performed. The cell in which the re-establishment procedure succeeds becomes the PCell while SCells and STAGs, if configured, are released.

https://www.etsi.org/deliver/etsi_ts/136300_136399/136331/15.03.00_60/ts_136331v150300p.pdf

39. The source eNodeB and UE maintain some context (e.g., C-RNTI) to return of UE in case of Handover failure.

10.1.2.1 Handover

The intra E-UTRAN HO of a UE in RRC_CONNECTED state is a UE-assisted network-controlled HO, with HO preparation signalling in E-UTRAN:

- Part of the HO command comes from the target eNB and is transparently forwarded to the UE by the source eNB;
- To prepare the HO, the source eNB passes all necessary information to the target eNB (e.g. E-RAB attributes and RRC context):
  - When CA is configured and to enable SCell selection in the target eNB, the source eNB can provide in decreasing order of radio quality a list of the best cells and optionally measurement result of the cells.
  - When DC is configured, the source MeNB provides the SCG configuration (in addition to the MCG configuration) to the target MeNB.
- Both the source eNB and UE keep some context (e.g. C-RNTI) to enable the return of the UE in case of HO failure;

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40. When handover fails, the source eNodeB receives a Handover Preparation Failure message from target eNodeB. This facilitates the source eNodeB to coordinate with UE to re-initiate the handover process using the context kept for this purpose.

One UE behaviour to be performed upon handover is specified, i.e. this is regardless of the handover procedures used within the network (e.g. whether the handover includes X2 or S1 signalling procedures).

The source eNB should, for some time, maintain a context to enable the UE to return in case of handover failure. After having detected handover failure, the UE attempts to resume the RRC connection either in the source PCell or in another cell using the RRC re-establishment procedure. This connection resumption succeeds only if the accessed cell is prepared, i.e. concerns a cell of the source eNB or of another eNB towards which handover preparation has been performed. The cell in which the re-establishment procedure succeeds becomes the PCell while SCells and STAGs, if configured, are released.

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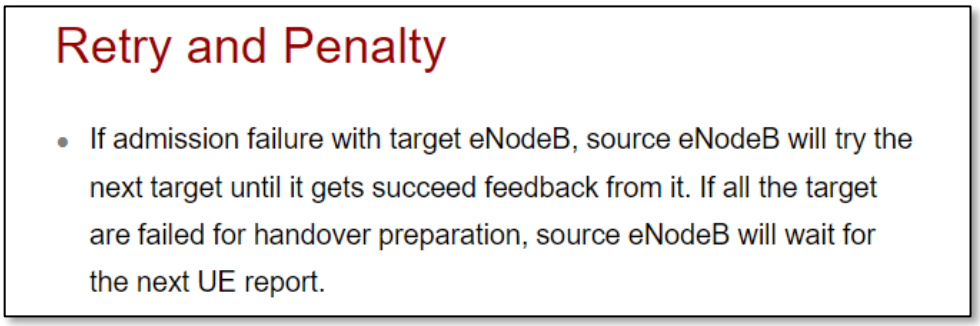
41. In the case of handover failure, the source eNodeB tries the next target until it gets the succeed feedback or wait for the second measurement report from the UE. Based on said set of the target base stations, source eNodeB can proceed with the next attempt for the handover.



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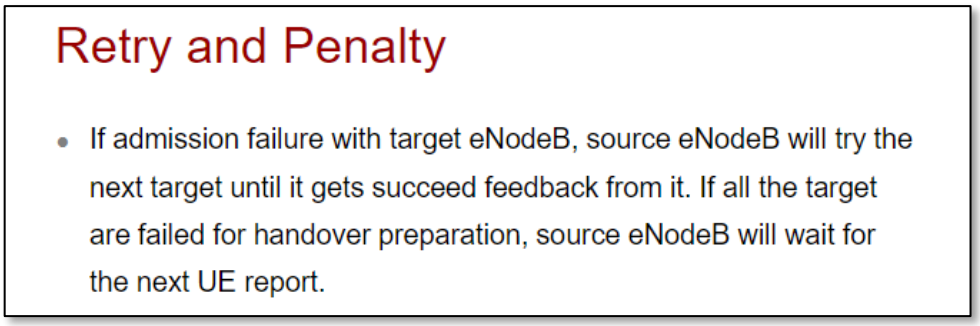
42. In the case of handover failure source eNodeB wait for the second measurement report from the UE and based on said report source eNodeB can proceed with the next attempt for the handover.



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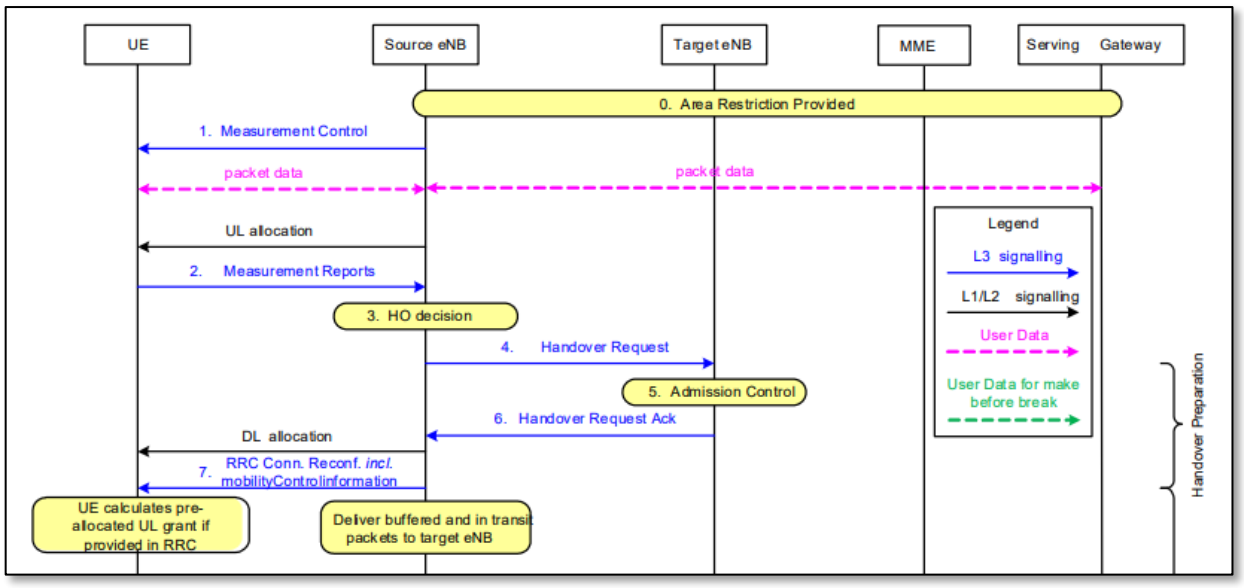
43. After detecting handover preparation failure for the first time, the source eNodeB initiates another handover preparation with a new target eNodeB by sending a new Handover Request message.



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44. The measurement reports transmitted by UE to source eNodeB provide signal quality information about the neighboring stations, which helps in deciding the target eNodeB for handover. This way the set of candidate base stations may also include base stations monitored from measurement reports.

2 A MEASUREMENT REPORT is triggered and sent to the eNB.

3 The source eNB makes decision based on MEASUREMENT REPORT and RRM information to hand off the UE.

4 The source eNB issues a HANDOVER REQUEST message to the target eNB passing necessary information to prepare the HO at the target side (UE X2 signalling context reference at source eNB, UE S1 EPC signalling context reference, target cell ID, K_{eNB*}, RRC context including the C-RNTI of the UE in the source eNB, AS-configuration, E-RAB context and physical layer ID of the source cell + short MAC-I for possible RLF recovery). UE X2 / UE S1 signalling references enable the target eNB to address the source eNB and the EPC. The E-RAB context includes necessary RNL and TNL addressing information, and QoS profiles of the E-RABs.

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45. In case of handover failure source eNodeB waits for the second measurement report from the UE and based on said report source eNodeB can select a set of candidate base stations.

- If admission failure with target eNodeB, source eNodeB will try the next target until it gets succeed feedback from it. If all the target are failed for handover preparation, source eNodeB will wait for the next UE report.

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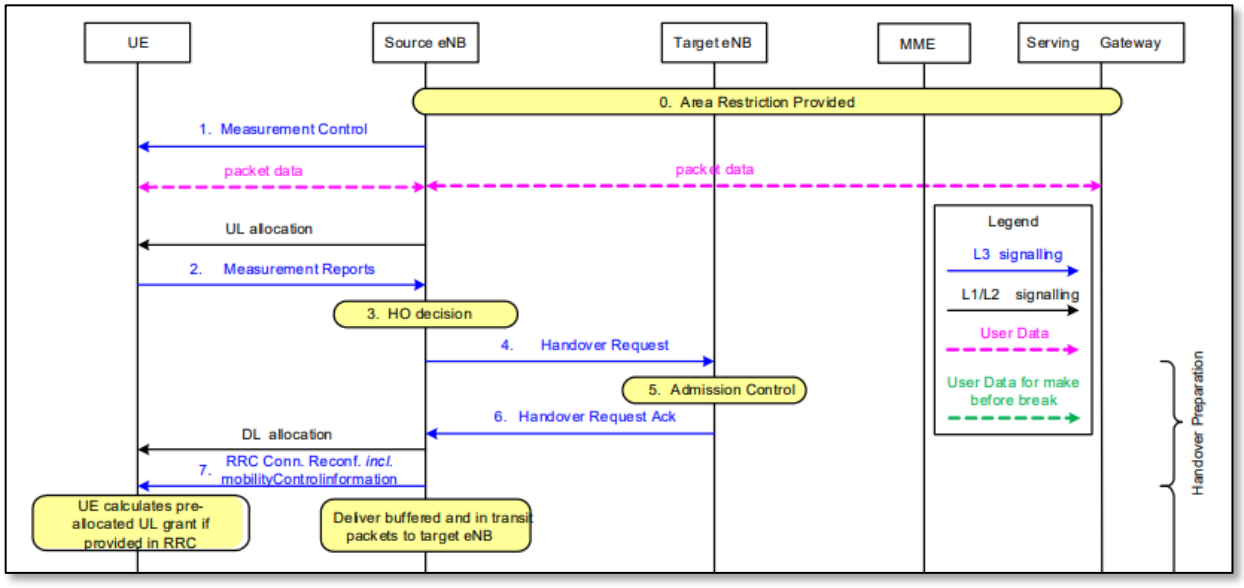
46. The target eNodeB sends Handover Request Acknowledgement message in response to Handover Request message from source eNodeB.



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47. The target eNodeB sends Handover Request Acknowledgement message to source eNodeB only when handover preparation and handover resource allocation is successful. In case of failure, the target eNodeB sends the Handover Preparation Failure message.

> The source eNB sends a HANDOVER REQUEST to the target eNB including the bearers to be setup by the target ENB.
>
> The handover preparation phase is finished upon the reception of the HANDOVER REQUEST ACKNOWLEDGE message in the source eNB, which includes at least radio interface related information (HO Command for the UE), successfully established E-RAB(s) and failed established E-RAB(s).
>
> In case the handover resource allocation is not successful (e.g. no resources are available on the target side) the target eNB responds with the HANDOVER PREPARATION FAILURE message instead of the HANDOVER REQUEST ACKNOWLEDGE message.

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48. Thus, handover preparation is complete when source eNodeB receives Handover Request Acknowledgement message from the selected target eNodeB (or, target station). The Handover Request Acknowledgement message confirms that the handover preparation has not failed and ensures the selection of target eNodeB for handover.

6 The target eNB prepares HO with L1/L2 and sends the HANDOVER REQUEST ACKNOWLEDGE to the source eNB. The HANDOVER REQUEST ACKNOWLEDGE message includes a transparent container to be sent to the UE as an RRC message to perform the handover. The container includes a new C-RNTI, target eNB security algorithm identifiers for the selected security algorithms, may include a dedicated RACH preamble, and possibly some other parameters i.e. access parameters, SIBs, etc. If RACH-less HO is configured, the container includes timing adjustment indication and optionally a preallocated uplink grant. The HANDOVER REQUEST ACKNOWLEDGE message may also include RNL/TNL information for the forwarding tunnels, if necessary.

NOTE: As soon as the source eNB receives the HANDOVER REQUEST ACKNOWLEDGE, or as soon as the transmission of the handover command is initiated in the downlink, data forwarding may be initiated.

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49. After receiving the Handover Request Acknowledgement for successful handover preparation, the handover process is started by the initiation of data forwarding. The target eNodeB generates an RRC message (e.g., RRCConnectionReconfiguration message) to perform handover. This message includes parameters required for handover, and it is sent by source eNodeB to the UE. The UE uses these parameters sent by the source eNodeB to perform handover.

6 The target eNB prepares HO with L1/L2 and sends the HANDOVER REQUEST ACKNOWLEDGE to the source eNB. The HANDOVER REQUEST ACKNOWLEDGE message includes a transparent container to be sent to the UE as an RRC message to perform the handover. The container includes a new C-RNTI, target eNB security algorithm identifiers for the selected security algorithms, may include a dedicated RACH preamble, and possibly some other parameters i.e. access parameters, SIBs, etc. If RACH-less HO is configured, the container includes timing adjustment indication and optionally a preallocated uplink grant. The HANDOVER REQUEST ACKNOWLEDGE message may also include RNL/TNL information for the forwarding tunnels, if necessary.

NOTE: As soon as the source eNB receives the HANDOVER REQUEST ACKNOWLEDGE, or as soon as the transmission of the handover command is initiated in the downlink, data forwarding may be initiated.

Steps 7 to 16 provide means to avoid data loss during HO and are further detailed in 10.1.2.1.2 and 10.1.2.3.

7 The target eNB generates the RRC message to perform the handover, i.e. *RRCConnectionReconfiguration* message including the *mobilityControlInformation*, to be sent by the source eNB towards the UE. The source eNB performs the necessary integrity protection and ciphering of the message.

The UE receives the *RRCConnectionReconfiguration* message with necessary parameters (i.e. new C-RNTI, target eNB security algorithm identifiers, and optionally dedicated RACH preamble, target eNB SIBs, etc.) and is commanded by the source eNB to perform the HO. If RACH-less HO is configured, the *RRCConnectionReconfiguration* includes timing adjustment indication and optionally preallocated uplink grant for accessing the target eNB. If preallocated uplink grant is not included, the UE should monitor PDCCH of the target eNB to receive an uplink grant. The UE does not need to delay the handover execution for delivering the HARQ/ARQ responses to source eNB.

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50. The source eNodeB sends Handover Request message to target eNodeB to initiate handover procedure. The Handover Request messages (or, first and second request)

sent by source eNodeB include bearers' information of the UE to be set up by the target eNodeB during handover.

> The source eNB sends a HANDOVER REQUEST to the target eNB including the bearers to be setup by the target ENB.
>
> The handover preparation phase is finished upon the reception of the HANDOVER REQUEST ACKNOWLEDGE message in the source eNB, which includes at least radio interface related information (HO Command for the UE), successfully established E-RAB(s) and failed established E-RAB(s).
>
> In case the handover resource allocation is not successful (e.g. no resources are available on the target side) the target eNB responds with the HANDOVER PREPARATION FAILURE message instead of the HANDOVER REQUEST ACKNOWLEDGE message.

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51. For example, the bearer can be Radio Access Bearer (e.g. E-RAB).

> 4 The source eNB issues a HANDOVER REQUEST message to the target eNB passing necessary information to prepare the HO at the target side (UE X2 signalling context reference at source eNB, UE S1 EPC signalling context reference, target cell ID, K_{eNB*}, RRC context including the C-RNTI of the UE in the source eNB, AS-configuration, E-RAB context and physical layer ID of the source cell + short MAC-I for possible RLF recovery). UE X2 / UE S1 signalling references enable the target eNB to address the source eNB and the EPC. The E-RAB context includes necessary RNL and TNL addressing information, and QoS profiles of the E-RABs.
>
> 5 Admission Control may be performed by the target eNB dependent on the received E-RAB QoS information to increase the likelihood of a successful HO, if the resources can be granted by target eNB. The target eNB configures the required resources according to the received E-RAB QoS information and reserves a C-RNTI and optionally a RACH preamble. The AS-configuration to be used in the target cell can either be specified independently (i.e. an "establishment") or as a delta compared to the AS-configuration used in the source cell (i.e. a "reconfiguration").

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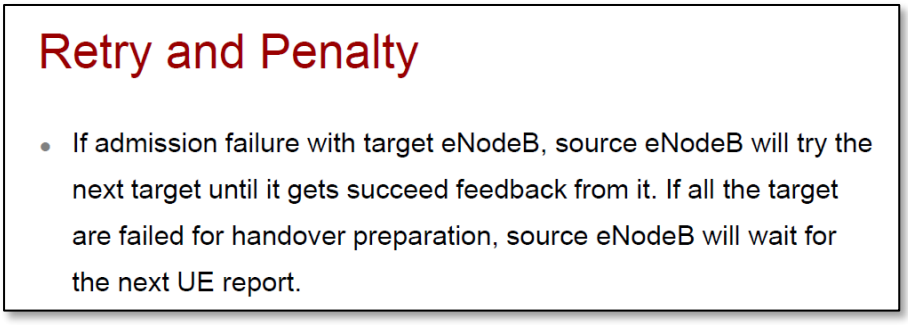
52. Handover preparation is re-initiated after failure for the first time



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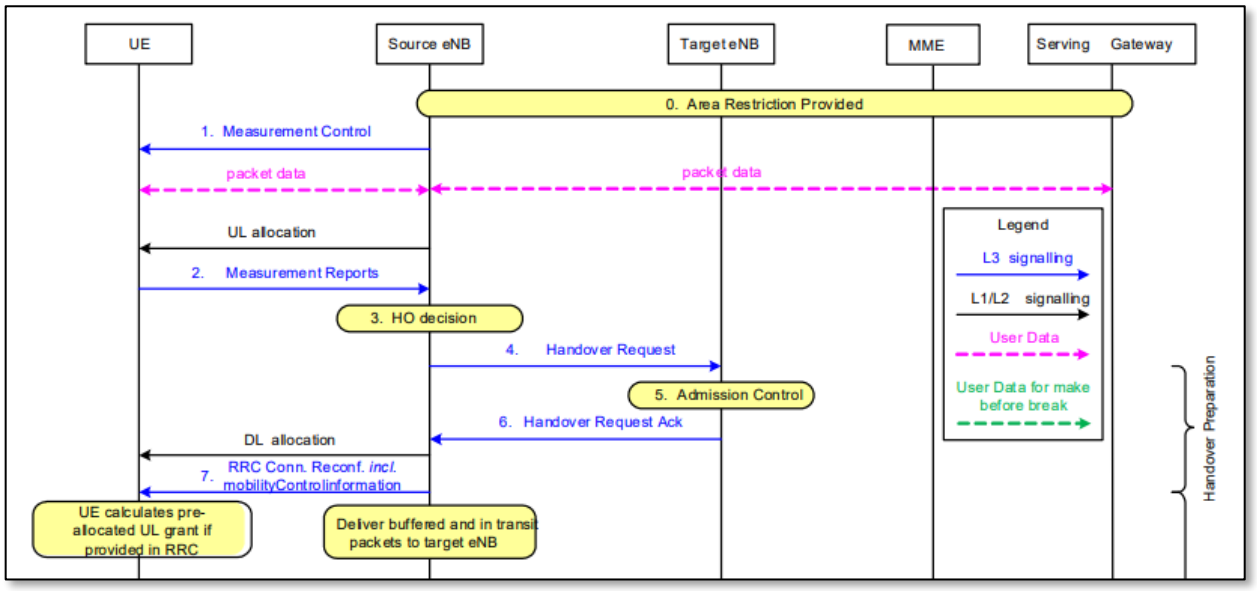
53. When the communication network decides to retrieve additional information for handover, the UE again performs the relevant measurements similar to the first time to provide measurement reports.



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54. UE measurement reporting is an inherent function of RRC for handover

- RRC (terminated in eNB on the network side) performs the functions listed in subclause 7, e.g.:
  - Broadcast;
  - Paging;
  - RRC connection management;
  - RB control;
  - Mobility functions;
  - UE measurement reporting and control, except for NB-IoT.

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55. The measurement reports contain quantities that relate to the signal quality of neighboring cells (or candidate base stations).

> One UE behaviour to be performed upon handover is specified, i.e. this is regardless of the handover procedures used within the network (e.g. whether the handover includes X2 or S1 signalling procedures).
>
> The source eNB should, for some time, maintain a context to enable the UE to return in case of handover failure. After having detected handover failure, the UE attempts to resume the RRC connection either in the source PCell or in another cell using the RRC re-establishment procedure. This connection resumption succeeds only if the accessed cell is prepared, i.e. concerns a cell of the source eNB or of another eNB towards which handover preparation has been performed. The cell in which the re-establishment procedure succeeds becomes the PCell while SCells and STAGs, if configured, are released.

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56. The measurement reports transmitted by UE to source eNodeB provide signal quality information about the neighboring stations, which helps in deciding the target eNodeB for handover. This way the set of candidate base stations may also include base stations monitored from measurement reports.

> 2 A MEASUREMENT REPORT is triggered and sent to the eNB.
>
> 3 The source eNB makes decision based on MEASUREMENT REPORT and RRM information to hand off the UE.
>
> 4 The source eNB issues a HANDOVER REQUEST message to the target eNB passing necessary information to prepare the HO at the target side (UE X2 signalling context reference at source eNB, UE S1 EPC signalling context reference, target cell ID, K_{eNB*}, RRC context including the C-RNTI of the UE in the source eNB, AS-configuration, E-RAB context and physical layer ID of the source cell + short MAC-I for possible RLF recovery). UE X2 / UE S1 signalling references enable the target eNB to address the source eNB and the EPC. The E-RAB context includes necessary RNL and TNL addressing information, and QoS profiles of the E-RABs.

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57. In view of preceding paragraphs, each and every element of at least claim 1 of the ’224 Patent is found in the Accused Products.

58. Huawei has and continues to directly infringe at least one claim of the ’224 Patent, literally or under the doctrine of equivalents, by making, using, selling, offering for sale, importing, and/or distributing the Accused Products in the United States, including within this judicial district, without the authority of Brazos.

59. Huawei has received notice and actual or constructive knowledge of the ’224 Patent since at least the date of service of this Complaint.

60. Since at least the date of service of this Complaint, through its actions, Huawei has actively induced product makers, distributors, retailers, and/or end users of the Accused Products to infringe the ’224 Patent throughout the United States, including within this judicial district, by, among other things, advertising and promoting the use of the Accused Products in various websites, including providing and disseminating product descriptions, operating manuals, and other instructions on how to implement and configure the Accused Products. Examples of such advertising, promoting, and/or instructing include the documents at:

- https://e.huawei.com/us/products/wireless/elte-trunking/network-element/dbs3900
- https://e.huawei.com/us/products/wireless/gsm-r/radio-access-network/bts3900a
- https://consumer.huawei.com/en/support/4g-lte-routers/lte-cpe-b310/
- https://consumer.huawei.com/en/phones/p30-pro/specs/
- https://www.honorcup.ru/upload/iblock/164/6.pdf
- https://www.scribd.com/document/134164391/LTE-Handover-Troubleshooting-Guide-pdf
- https://www.etsi.org/deliver/etsi_ts/136300_136399/136300/15.03.00_60/ts_136300v150300p.pdf
- https://www.etsi.org/deliver/etsi_ts/136300_136399/136331/15.03.00_60/ts_136331v150300p.pdf
- https://www.scribd.com/document/182810551/ANR-Feature-Huawei
- https://www.scribd.com/presentation/228456406/5-LTE-ERAN6-0-Handover-Feature-ISSUE1-00

61. Since at least the date of service of this Complaint, through its actions, Huawei has contributed to the infringement of the ’224 Patent by having others sell, offer for sale, or use the Accused Products throughout the United States, including within this judicial district, with knowledge that the Accused Products infringe the ’224 Patent. The Accused Products are especially made or adapted for infringing the ’224 Patent and have no substantial non-

infringing use. For example, in view of the preceding paragraphs, the Accused Products contain functionality which is material to at least one claim of the ’224 Patent.

JURY DEMAND

Brazos hereby demands a jury on all issues so triable.

REQUEST FOR RELIEF

WHEREFORE, Brazos respectfully requests that the Court:

(A) Enter judgment that Huawei infringes one or more claims of the ’224 Patent literally and/or under the doctrine of equivalents;

(B) Enter judgment that Huawei has induced infringement and continues to induce infringement of one or more claims of the ’224 Patent;

(C) Enter judgment that Huawei has contributed to and continues to contribute to the infringement of one or more claims of the ’224 Patent;

(D) Award Brazos damages, to be paid by Huawei in an amount adequate to compensate Brazos for such damages, together with pre-judgment and post-judgment interest for the infringement by Huawei of the ’224 Patent through the date such judgment is entered in accordance with 35 U.S.C. §284, and increase such award by up to three times the amount found or assessed in accordance with 35 U.S.C. §284;

(E) Declare this case exceptional pursuant to 35 U.S.C. §285; and

(F) Award Brazos its costs, disbursements, attorneys’ fees, and such further and additional relief as is deemed appropriate by this Court.

Dated: June 17, 2020

Respectfully submitted,

/s/ James L. Etheridge

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